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computing services

ComputerNews

UTCS

OSA90 (Optimization Shell Assembly) is an optimization package that runs on Sun and Hewlett-Packard workstations. The package is designed to handle situations where a function (or functions) of one or two variables with respect to a set of parameters.

WordPerfect has changed its policy pertaining to the relationship between universities and hospitals.

REACH (Research and Educational Applications of Computers in the Humanities), the newsletter of the Humanities Computing Facility of the University of California at Santa Barbara, is now available both through Listserv as well as through anonymous file transfer protocol (FTP).

The Department of Planning and Coordination has prepared an Annual Report outlining projects completed by all departments in the Division of Computing and Communications.

Did you know that right here on the St. George campus there is a group of computer specialists who are ready, willing and waiting to provide expert installation and repair services for your personal computers?

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Thanks to Amanda Wagner and Elizabeth Rayson for their assistance in editing this issue.

This newsletter was entirely produced on a Macintosh using PageMaker and other related Macintosh software.

Q *"What is a modem, and how can I use it at U of T?"*

A *"The modem (MOdulator-DEModulator) is your computer's link with the world outside; it is a device that takes information from the computer and translates it into signals that can be sent over the telephone line."*

Modems: Computing Tips from Advising and Consulting

Jon Alexander
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Modems come in one of two forms:

1. a card that plugs into a slot inside your computer; or
2. a separate, exterior box that connects to the serial port on the back of your PC.

For the exterior box modems, you usually need a cable with a connector on each end, each looking like one of the following (see *Figure 1*):

1. Two rows of 25 pins or holes, referred to as "DB-25." The connector with pins is often referred to as "male," and the one with holes referred to as "female."
2. Two rows of 9 pins or holes, referred to as "DB-9."
3. A round connector with 8 pins or holes, referred to as "DIN-8."

Obviously the connector will have to fit the port into which it plugs.

This cable will plug into the serial port on the back of your computer. Most modems have a 25-pin port at the back of them, so one end of your cable will probably need to be 25-pin. On a PC-compatible, the serial port is usually a DB-25 or DB-9 connector; on an Apple Macintosh, it is usually a DIN-8 connector.

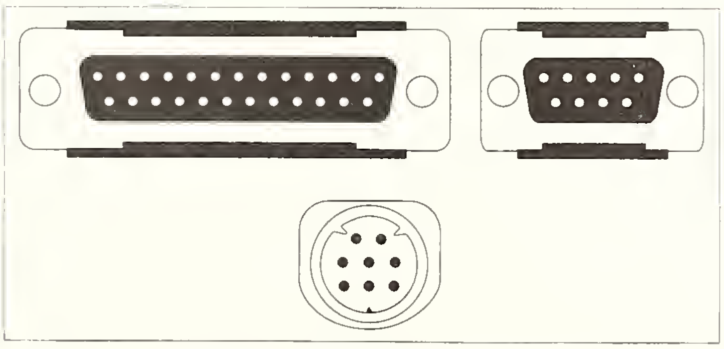

Figure 1: a DB-25 connector (top left), a DB-9 connector (top right), and a DIN-8 (bottom centre).

Modems normally plug into a standard telephone jack; most modems will allow you to plug in your regular phone as well, usually into a second jack on the back of the modem, so that you may use your phone normally at times when your modem is not turned on and connected. The manual for your modem should describe how to do this; on modems with two jacks, the jacks will normally be labelled "to phone" (plug in the telephone set here) and "to line" (plug in to the wall jack).

As well, most external modems and some internal modems will come with indicator lights on the front, which normally operate when the modem is powered on. These can be useful to tell what the modem is doing at any given time.

Most modems will have some way of indicating that they are powered on, either by flicking all the lights at power-on time or with a steadily-shining "Power" or "On" light. For Hayes-compatible modems,* some of the other useful indicator lights are:

Tx/Rx — "Transmit/Receive" — This light flashes when data are sent through the modem, either by your computer ("transmit") or by the remote "host" computer ("receive"). This is the light you will watch when you are checking your modem to see if it is hooked up properly. See the next section, "A Conversation with your Modem."

OH — "Off-Hook" — This light is on whenever the modem has engaged your phone line to begin a call (i.e., the phone is "off-the-hook").

HS — "High Speed" — On modems with multiple speeds, this will tell you when the modem is operating at the higher speed. Most multiple-speed modems have two speeds, for example 1200 bits per second (bps) and 2400 bps.

** see glossary*

Features

A Conversation with your Modem

The following is a typical session you would have with a modem if it is Hayes-compatible. For comparison, we've shown the equivalent natural language conversation that you might have with a human being, if she or he were a modem (note that this is unlikely in reality).

If we were conversing with a modem, our dialogue would look something like this:

```
AT
O K
ATDP 978 7239
Dialing...

CONNECT

Hi
"Hi there. I'm here and ready to do work for
you"
Hi, dial 978 7239 for me, will you?
"OK, I'm dialing it now.  Let's see
9...7...8.......7...2...3...9"
(RRING-RRRING-RRING...>click<...)


"OK, I'm connected"
```

(We'd hear the phone dial, and, if a free line was available, the phone at the other end would answer. We would hear the modems' carrier signals* as they recognize each other, and we'd see the following message.)

(Then, by pressing return, we could begin talking to the computer on the other end.)

If the modem were a real person, the conversation might look like this:

(The modems would exchange greetings with high-pitched tones.)

The Advising Desk can provide you with further information on accessing UTCS services via modem. We distribute several helpful pamphlets on each service. The Advising Desk can be reached by phoning 978-4357 (HELP) during the hours of operation, 12:00 noon to 6:00 p.m., Monday through Friday.

** see glossary*

Glossary

"BPS" or "bps" — "bits per second" — The speed at which a modem sends information. Usually, you can calculate roughly the number of characters (single letters or numbers) sent by dividing a modem's "bps" rating by 10. For example a 2400 bps modem sends approximately 240 characters per second. (See "Selecting Modems" by Doug Carson, *ComputerNews*, March 1992, p. 9)

"carrier" — Analog signal (usually an audible continuous tone) used by modems to communicate with each other. Data can be sent by modulating this signal to represent the digital information from a computer.

Hayes-compatible — A type of modem that behaves like one manufactured by the Hayes Corporation, especially one that uses the same set of commands used by Hayes modems. It is the most popular type of modem for microcomputer communications, and it has become an industry standard. Most modems you can purchase for this type of communications will be Hayes-compatible.

Modem — (MOdulator-DEModulator) — Device for sending computer data over the phone lines by modulating an analog signal.

Novell Conference: Brainshare 1992

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The University of Utah in Salt Lake City was host to 2,500 attendees of the Novell Developers Conference, Brainshare. This year's conference included the Technology Transfer Partnership Conference, which is Novell's way of bringing together universities that use Novell products.

The conference was four and a half days of keynote speakers, breakout sessions, lunch speakers, and evening meetings with Novell scientists and third-party vendors. All the keynote speakers were industry heavyweights with great influence on the future development of the personal computer industry.

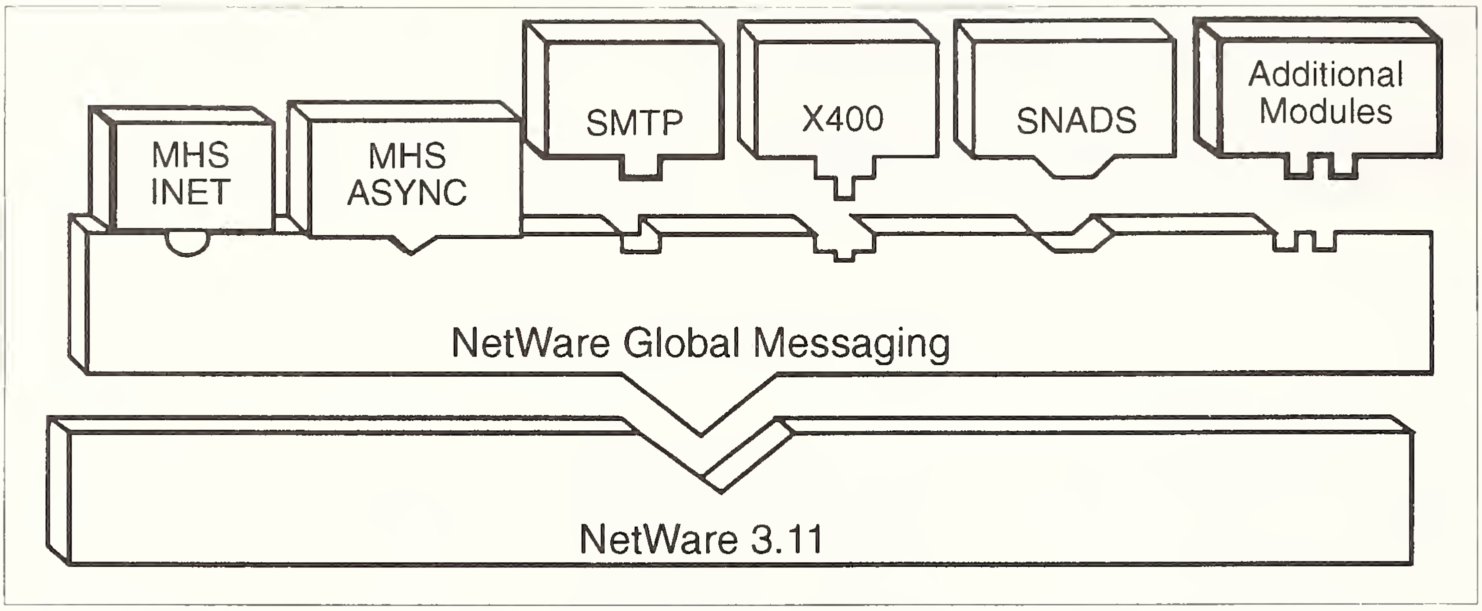
Andrew Grove, president of Intel, focused on collaborative computing and the need for "natural" or "rich" data types (such as continuous and digitized sound, images, animation and full motion video). Naturally, Intel expects users to need more CPU power (millions of instructions per second or MIPS) to handle these new data types, as well as greater bandwidth on the networks. Grove also discussed the P5 chip (a superscalar processor with about 200 MIPS), and conjectured about what the computing generation after that will hold.

Steve Ballmer, vice president of Microsoft, spoke of how Windows 3.1 and Windows NT form the basis of Microsoft's systems software platform, which is designed to deliver Microsoft's goal of "information at your fingertips." Querying the audience, he found that 75% were Windows users and 50% were Windows developers. Since the conference was held before the April 6 rollout of Windows 3.1, Ballmer demonstrated version 3.1 and explained some of the more important benefits of this new release. These include a new file manager, persistent network connections, easy installation from a network, TrueType scaleable fonts, and Multimedia and Pen extensions.

Robert Frankenberg, vice president and general manager of Hewlett-Packard, presented a different perspective. He feels that information access using a kind of "just in time" approach is needed. Because there is more information available to us than we can scan and retain, we need tools that allow us to access information when it is needed. We need enhanced personal communication in the form of Personal Digital Assistants (PDAs) to obtain information, and full wireless communication to get the information where we need it to go. As a start to this trend, he indicated that Hewlett-Packard's graphical user interface, NewWave 4, will have agents to automate processes. On a more down-to-earth scale, watch for more NetWare "plug and play" printers and plotters from HP. He believes we are finally moving from the "plug and pray" to the "plug and play" stage!

Philippe Kahn, president and CEO of Borland, gave a very interesting talk and product demonstration. He is an object-oriented evangelist, and demonstrated dBASE for Windows, Paradox for Windows, and Quattro Pro for Windows. These applications have a very broad access to rich data types, and to illustrate this, he demonstrated graphics and sound data types in dBASE for Windows using the Microsoft Multimedia Extensions. Kahn did some dynamic application creation in Paradox for Windows, linking to both Paradox and dBASE tables, and demonstrated the creation of links to graphics and other data types using Object Linking and Embedding (OLE). His entire demonstration was done using the new Windows 3.1.

At an evening session, Steve Jobs, president, chairman and founder of NeXT Computer, provided a discussion of the "NeXT revolution" and a lively demonstration of the capabilities of NeXT computers. Built-in Ethernet connectivity, Novell networking as part of the operating system (in beta test now and tentatively scheduled to ship in June), object-oriented interface, and application building tools all support his current slogan, "it just works." As well, NeXT will be porting its operating system to the Intel 486 platform (scheduled in 1992). Jobs feels that since NeXT computers are well



NetWare Global Messaging integrates with NetWare, and additional protocols integrate with NetWare Global Messaging.

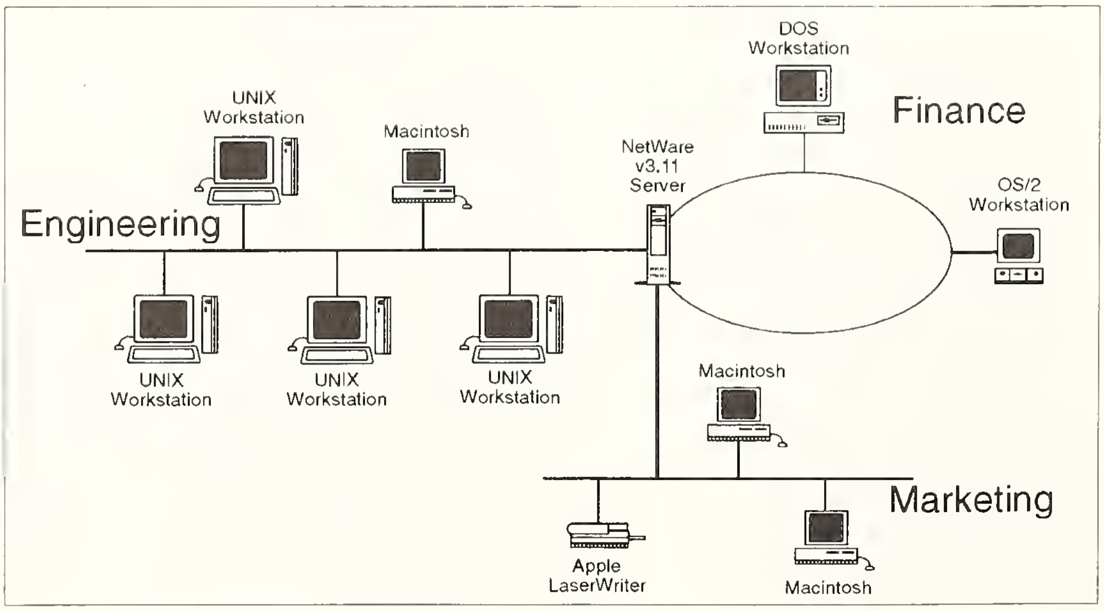
known for their ability to create custom applications very quickly, companies using NeXT technology will have a strong competitive edge.

The conference breakout sessions covered all aspects of Novell networking, from cabling to multiple platform integration. I attended sessions on Macintosh and UNIX connectivity, database technology within the Novell environment, data transports, messaging, document imaging services, NetWare and Windows, and detecting viruses in a NetWare environment. At some sessions, new products were announced, including NetWare Global Messaging.

NetWare Global Messaging is a family of NetWare Loadable Modules for NetWare 3.11. Intended as an integration platform for enterprise-wide messaging, it allows store and forward communications among popular industry standard messaging protocols such as NetWare MHS, Simple Mail Transfer Protocol (SMTP), System Network Architecture Distribution Services (SNADS), and OSI X.400 protocols. The product provides a distributed and replicated directory database across multiple servers. A user name can be added to one server, and the information will be automatically updated on other participating servers. Asynchronous communication features include support for multiple transmission media, simplified modem definition, and public data network support.

For more information about the conference, contact Terry Jones at 978-4924.

An integrated network of Macintoshes, PCs, and UNIX workstations using a Novell server.



Changes to WordPerfect Site Licence Eligibility Requirements

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WordPerfect Corporation has changed its policy pertaining to the relationship between universities and hospitals in the United States. As a repercussion of this change, a new policy is being developed for teaching hospitals affiliated with universities in Canada. Until the new Canadian policy is in place, Sunnybrook is the only hospital qualifying as being part of the University of Toronto campus and, therefore, the only hospital location eligible for the current School Software Licensing Program administered by UTCS.

There are three conditions of use for all WordPerfect 5.1 licences administered by UTCS:

1. The licences can only be purchased by U of T employees.
2. The software can only be used on the U of T campus.
3. The software remains the property of the University of Toronto, and reverts to it should the purchaser leave the employ of the University.

Until the new Canadian policy is finalized, hospitals (except Sunnybrook) are not considered part of the University of Toronto campus. Cross-appointed researchers and other University of Toronto employees who previously were able to purchase WordPerfect licences from UTCS for use on their machines in their hospital offices can no longer do so. They will have to purchase the "educational" package from a local retailer, such as the University of Toronto Computer Shop. As always, persons wholly employed by hospitals and not employed by the University of Toronto cannot buy or use the WordPerfect software purchased from UTCS.

The Micro Sales and Maintenance Group

Kam Mark
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Did you know that right here on the St. George campus there is a group of computer specialists who are ready, willing and waiting to provide expert installation and repair services for your personal computers? Yes, there is! — the Micro Sales and Maintenance Group of UTCS!! Do you need to have your computer hardware set up, software or LAN installed? UTCS can do it for you! Do you have a problem with your computer and you don't know whether it's a hardware, software, or local area network fault? UTCS can resolve and repair it for you! All at competitive rates (and we keep the money within the University).

UTCS is a fully authorized Apple Service Centre. We will maintain your Apple equipment ON SITE for the same price you would pay for AppleCare. Why bother with the inconveniences of taking your computers to a service centre, picking them up, and keeping track of your warranty forms? We are also an authorized repair centre for Packard Bell and Zenith personal computer equipment if you need warranty work done.

We provide three types of service: an annual maintenance contract, a labour only contract, or a "per call" service.

Under an annual maintenance contract, customers receive the first priority of calls. All work is done on site and all labour and parts are included. This type of contract guarantees a maximum response and minimum repair time. A fee covering the maintenance period is payable in advance. (Please see pages 7-8 of this issue of *ComputerNews* for annual maintenance prices of typical systems.)

A labour contract specifies the number of hours of service and the specific services that will be provided for a specified fee payable in advance. The hourly rate is discounted from the "per call" rates — the discount is dependent on the number of hours of the contract. This type of contract ranks after an annual maintenance contract in terms of priority of calls. Parts are NOT covered and no maximum repair time is guaranteed. All services are performed on site.

The third type of service that we provide is "per call" service. No fee is payable in advance — pay only as you need the service. We do on site and depot service on a time and material basis. There is a minimum charge of $60.00 for an on site service call but no minimum is chargeable on depot service.

Consider as well the following advantages of dealing with UTCS:

- NO taxes, PST or GST, are payable because these services are internal transactions.
- We are on campus and can provide you with quicker response times (average about two hours).
- You are always dealing with the same trusted people from within the University.
- We are a complete service centre: we also service IBM, Commodore, Dell, and other clones. Also, we can take care of your local area networks, both hardware and software.
- We are backed by the full range of UTCS resources.

As our name implies, we also can assist your department in purchasing certain manufacturers' personal computer products at substantial savings. Such purchases are intended to be institutional; i.e., they must be charged to a University debit memo. For now, we can supply Packard Bell and Zenith computers. We are engaged in negotiations with other manufacturers for their products as well. If you are interested in purchasing either Packard Bell or Zenith equipment please call us for a quotation.

Let us take care of your computer equipment requirements. Please call me at 978-5050. Let's talk about how we can be of service to you.

Typical Systems Pricing - Annual Maintenance

1992 Maintenance Contract Pricing : MS-DOS Computers & Peripherals

Typical System Prices	**Annual**
PC, XT or Compatible (4.77 MHz) Monochrome Monitor 640 K RAM, 2 - 360 K Floppies 1 - 20/30MB Hard Disk	144.00
PC/AT or Compatible (6,8,12 MHz) Monochrome Monitor 640 K RAM, 1 - 40MB Hard Disk 1 - 360 K & 1.2MB Floppy	204.00
IBM PS/2 - 30 Monochrome Monitor 1MB RAM, 1 - 20MB Hard Disk 1 - 720 k floppy	204.00
286 PC or Compatible (16 MHz) Monochrome Monitor 2MB RAM, 1 - 40MB Hard Disk 1 - 1.2MB & 1.44MB Floppy	216.00
IBM PS/2 - 50 Monochrome Monitor 1MB RAM, 1 - 40MB Hard Disk 1 - 1.4MB Floppy	240.00
386 Sx/Dx or Compatible (16-25 MHz) Monochrome Monitor 2MB RAM, 1 - 40MB Hard Disk 1 - 1.2MB & 1.44MB Floppy	240.00
386 Dx or Compatible (33 MHz) Monochrome Monitor 2MB RAM, 1 - 40MB Hard Disk 1 - 1.2MB & 1.44MB Floppy	264.00
486 Dx or Compatible (33 MHz) Monochrome Monitor 2MB RAM, 1 - 40MB Hard Disk 1 - 1.2MB & 1.44MB Floppy	288.00

Monitors	**Annual**
Monochrome	12.00
EGA or VGA Colour	24.00
SVGA Colour	36.00
Disk Drives	
360 K, 720 K, 1.2 & 1.44MB Floppy	12.00
20 - 40MB Hard Disk (IDE)	12.00
50 - 60MB Hard Disk (IDE)	24.00
100MB Hard Disk (IDE)	36.00
120MB Hard Disk (IDE)	48.00
240MB Hard Disk (IDE)	96.00
Tape Backup	
Colorodo 120MB Internal	24.00
Colorodo 250MB Internal	36.00
Colorodo 120MB External	36.00
Colorodo 250MB External	48.00
Modems & Mice	
Logitech Mouse	12.00
1200/2400 Baud Modem	12.00
Printers	
Dot Matrix Panasonic KX1090/92, KX1191, KX1592 Epson FX100,FX185,FX286, IBM ProPrinter	48.00
Letter Quality IBM ProPrinter XL,C-ITOH F10-55 Epson LQ1000,LQ1050,LQ1500,LQ2500,LQ2550	60.00
High Quality & Speed Toshiba P341SL, P351, P351SX Fujitsu DL2400/2600	96.00
Laser	
HP LaserJet IIP	204.00
HP LaserJet IIIP	240.00
HP LaserJet, LaserJet II & III	360.00
QMS 410,800, 810, PS Jet+	360.00

1992 Maintenance Contract Pricing : Apple Macintosh Computers & Products

System Prices	**Annual**
Mac 128, 512, Plus	156.00
Mac Classic - 40MB HD	168.00
Mac Classic II - 40MB HD	192.00
Mac Classic II - 80MB HD	240.00
Mac LC - 40MB HD	216.00
Mac LC - 80MB HD	252.00
Mac LCII - 40MB HD	228.00
Mac LCII - 80MB HD	252.00
PowerBook 100 - 20MB HD	192.00
PowerBook 100 - 40MB HD	192.00
PowerBook 140 - 20MB HD	240.00
PowerBook 140 - 40MB HD	276.00
PowerBook 170 - 40MB HD	348.00
Mac SE - 20MB HD	252.00/312.00
Mac SE - 40MB HD	288.00/360.00
Mac SE/30 - 40MB HD	396.00
Mac SE/30 - 80MB HD	504.00
Mac II - 40MB HD	372.00
Mac II - 80MB HD	552.00
Mac IIx - 40MB HD	528.00
Mac IIx - 80MB HD	624.00
Mac IIcx - 40MB HD	420.00
Mac IIcx - 80MB HD	552.00
Mac IIci - 40MB HD	492.00
Mac IIci - 80MB HD	624.00
Mac IIsi - 40MB HD	300.00
Mac IIsi - 80MB HD	360.00
Mac IIfx - 80MB HD	696.00
Mac IIfx - 160MB HD	780.00
Quadra 700 - 80MB HD	660.00
Quadra 700 - 160MB HD	720.00
Quadra 700 - 400MB HD	792.00
Quadra 900 - 160MB HD	876.00
Quadra 900 - 400MB HD	828.00

Monitors	**Annual**
Mac 12" Mono	36.00
Mac 12" RGB	60.00
Hi-Res 12" Mono	48.00
Hi-Res 13" Colour	84.00
Portrait Display	84.00
Two-Page Mono	168.00
Mac 16" Colour	144.00
Mac 21" Colour	360.00
Disk Drives	
400K / 800K / 1.44MB Floppy	36.00
20 Megabyte Hard Drive	84.00
40 Megabyte Hard Drive	132.00
80 Megabyte Hard Drive	168.00
160 Megabyte Hard Drive	252.00
Compact Disk CD	132.00
Tape Backup	
Apple 40SC Tape Backup	168.00
Modems & Scanners	
Personal Modem (1200 baud)	36.00
Data Modem (2400 baud)	36.00
Fax Modem	48.00
Scanner	192.00
OneScanner	120.00
Printers	
ImageWriter I, II, IIL	84.00
StyleWriter	84.00
LaserWriter Plus	228.00
Personal LaserWriter LS	156.00
Personal LaserWriter SC	192.00
Personal LaserWriter NT	252.00
Personal LaserWriter NTR	228.00
LaserWriter II SC	228.00
LaserWriter II NT	324.00
LaserWriter II NTX	432.00
LaserWriter IIf	288.00
LaserWriter IIg	384.00

Rates quoted include all parts and labour. Equipment must be certified as operational by a representative of UTCS prior to commencement of a maintenance contract. No extra "check-out" fee, PST or GST are charged on maintenance contracts for University of Toronto departments. (Service rates are subject to change without notice.) UTCS will also consider maintenance, on a time and material basis for many types of microcomputers (e.g., Commodore, Packard Bell, Zenith).

Drop-off service is $60/hour with no minimum and does not include parts. The rate for on-site service is $60/hour plus travel and also does not include parts. A minimum charge of one hour per call applies to all on-site calls. UTCS also supplies and installs floppy drives, hard drives, video boards, math coprocessors, and memory upgrades.

Operating hours: 9:00 a.m. to 5:00 p.m., Monday through Friday (excluding legal and University holidays).

INTERNET NOTES

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REACH (Research and Educational Applications of Computers in the Humanities) Available Through Anonymous FTP

REACH (Research and Educational Applications of Computers in the Humanities), the newsletter of the Humanities Computing Facility of the University of California at Santa Barbara, is now available both through Listserv as well as through anonymous file transfer protocol (FTP). The newsletter contains a broad spectrum of information relating to all areas of the humanities and can be very helpful to the scholar and researcher.

If you think that *REACH* might be helpful to you, you can either request a subscription to the electronic mail version, or use FTP to obtain back issues. We will explain how to do both.

To Request Subscriptions

To subscribe to the electronic version of REACH, send an ordinary electronic mail message to *listserv@ucsbvm* after you have logged in to your account. Don't put anything in the subject line. In the body of the message, just enter the following (the text that you are to type is preceded by a pointing hand (☛)):

```
☛ subscribe reach <your name>
```

Use your own name, not your electronic mail address, and don't put quote marks around your name. VM/CMS users might prefer to use the TELL command. For example:

```
☛ TELL ucbvm subscribe reach John Jones
```

To Obtain Back Issues

The *REACH* newsletter, including all back issues, is also available via anonymous FTP. FTP has been discussed in previous *ComputerNews* articles. To obtain any issue simply type:

```
☛ FTP ucsbuxa.ucsb.edu or
☛ FTP 128.111.122.50
```

Log in as 'anonymous' and give your logon userid as the password. After that, enter 'cd hcf' to change to the proper directory. You can use the 'ls' command to view the contents of the directory and then the 'get' command to obtain the file (issue) that you want. In this article, we show the information that is displayed when you issue the 'ls' command. We also show how to obtain the 'readme' document associated with the directory as well as one of the newsletters. You should be aware that some of the responses from the UCSB server can take some time to transmit, so have patience.

INTERNET NOTES

```
gpu.utcs%                                 ☛ ftp 128.111.122.50
Connected to 128.111.122.50.
220 ucsbuxa FTP server (SunOS 4.1) ready.
Name (128.111.122.50:herb):               ☛ anonymous
331 Guest login ok, send ident as password.
Password:                                 ☛ Herb                  (You type your
                                                                        logon id)

230 Guest login ok, access restrictions apply.
ftp>                                      ☛ cd hcf                (You change
                                                                       directory)

250 CWD command successful.
ftp>                                      ☛ ls                       (You list
                                                                  the directory)

200 PORT command successful.
150 ASCII data connection for /bin/ls (128.100.100.1,2269) (0 bytes).
total 283
-r--r--r--  1 6865     100          7800 Dec 11  1990 reach.8912
-r--r--r--  1 6865     100         19391 Dec 11  1990 reach.9001
-r--r--r--  1 6865     100         18253 Feb 28 14:29 reach.9002
-r--r--r--  1 6865     100         17893 Dec 11  1990 reach.9003
-r--r--r--  1 6865     100         18874 Dec 11  1990 reach.9004
-r--r--r--  1 6865     100         18248 Dec 11  1990 reach.9005
-r--r--r--  1 6865     100         37066 Dec 11  1990 reach.9009
-r--r--r--  1 6865     100         17141 Nov  2 17:07 reach.9011
-r--r--r--  1 6865     100         16206 Feb  7  1991 reach.9101
-r--r--r--  1 6865     100         17080 Apr  4  1991 reach.9103
-r--r--r--  1 6865     100         17739 Jun  8  1991 reach.9105
-r--r--r--  1 6865     100         35643 Nov  2 17:12 reach.9110
-r--r--r--  1 6865     100         38657 Feb 28 14:42 reach.9201
-r--r--r--  1 6865     100          4301 Feb 28 14:40 readme
226 ASCII Transfer complete.
ftp>                                      ☛ get readme          (You get 'readme')
200 PORT command successful.
150 ASCII data connection for readme (128.100.100.1,2281) (4301 bytes).
226 ASCII Transfer complete.
4455 bytes received in 1.8 seconds (2.4 Kbytes/s)
ftp>                                      ☛ get reach.9201   (You get newsletter 9201...)
200 PORT command successful.
150 ASCII data connection for reach.9201 (128.100.100.1,2283) (38657 bytes).
226 ASCII Transfer complete.
39807 bytes received in 4.7 seconds (8.3 Kbytes/s)
ftp>                                      ☛ bye                          (and exit)
221 Goodbye.
```

If you have any trouble obtaining REACH, please write to *herb@gpu.utcs.utoronto.ca*.

The INTERNET TELNET Protocol

In previous articles, we have discussed various aspects of the INTERNET File Transfer Protocol (FTP). FTP allows you to access a remote machine and then transfer data from that machine to your own.

The INTERNET also supports a remote terminal program protocol called TELNET. TELNET allows a user at one site to create a connection to a server at another site, and then to pass keystrokes from the local machine directly to the remote machine. In essence, this protocol allows the user to execute a dialog with the server at the remote machine. Although we have illustrated TELNET in earlier articles, we have not yet defined it. The "INTERNET Accessible Libraries" article in this issue of *ComputerNews* defines TELNET logon sequences to various Canadian libraries through the use of this protocol. It is a very useful tool.

With all of this in mind, it might be useful to show a complete TELNET dialog. There are many such dialogs, and we will discuss some of the more important ones in future articles. We chose the University of Michigan's Geographic Name Server because it is quite easy to use and can also be helpful at times. Let's see, then, what we can learn about Toronto through the following dialog. To gain access to the Geographic Name Server, type the text that is preceded by a pointing hand (☛).

```
gpu.utcs%                                   ☛ telnet hermes.merit.edu

Trying...
Connected to hermes.merit.edu.
Escape character is '^]'.

%Merit:Hermes (HME42A:TN10:VT100:EDIT=MTS)

Which Host?                                 ☛ um-gns                      (University of
%TN10:HME42A-HME42C:TN00 um-gns                                  Michigan—Geographic
                                                                        Name Server)
%Call connected - 141.212.99.9
# Geographic Name Server, Copyright 1989, 1990 Merit Inc.  All rights reserved.
# >>> NEW VERSION!!! <<< Use "help" or "?" for details.
.
                                            ☛ toronto
0 Toronto
3 CA Canada
R Ontario
F 45 Populated place
L 43 39 10 N  79 23 00 W

0 Toronto
1 17167 Sangamon
2 IL Illinois
3 US United States
F 45 Populated place
L 39 42 50 N  89 37 47 W
Z 62707
```

```
0 Toronto
1 19045 Clinton
2 IA Iowa
3 US United States
F 45 Populated place
L 41 54 18 N  90 51 50 W
P 172
E 720
Z 52343

0 Toronto
1 20207 Woodson
2 KS Kansas
3 US United States
F 45 Populated place
L 37 47 56 N  95 56 56 W
P 466
E 950
Z 66777

0 Toronto
1 29029 Camden
2 MO Missouri
3 US United States
F 45 Populated place
L 38 00 13 N  92 31 31 W
E 743

0 Toronto
1 39081 Jefferson
2 OH Ohio
3 US United States
F 45 Populated place
L 40 27 51 N  80 36 04 W
P 6934
Z 43964

0 Toronto
1 46039 Deuel
2 SD South Dakota
3 US United States
A 605
F 45 Populated place
L 44 34 23 N  96 38 32 W
P 236
E 1997
Z 57268
```

```
0 Toronto
1 48043 Brewster
2 TX Texas
3 US United States
F 45 Populated place
L 30 20 24 N 103 45 00 W
E 4730

.
                                              ☛ quit                          (You exit from the
                                                                                     processor)
%Call cleared - 141.212.99.9
%TN10:HME42A-HME42C:TN10 141.212.99.9 15:40:18 Connection clcsed
Connection closed by foreign host.
gpu.utcs%                                                                (Control is back to you)
```

In this particular case, the server is aware of seven Torontos, but only one in Canada. You can learn about the meanings of the numeric and alphabetic codes in these listings (0, 1, 2, A, E, and so on) by using the server's online help. Type "help" or "?" when you enter the server for the first time and the server will provide you with the definitions.

As stated previously, there are many types of servers, and in future articles we hope to introduce to you what may be the more beneficial ones for you. If you have any questions about this article or about the INTERNET, please write to *herb@gpu.utcs.utoronto.ca*.

INTERNET Accessible Libraries

There are hundreds of libraries accessible through the INTERNET, far too many to list individually. Although there are many publications that mention at least some of these libraries, there are two major publications that are considered to be authoritative references. The first is the *INTERNET-Accessible Library Catalog & Databases*, which is co-authored by Dr. Art St. George of the University of New Mexico and Dr. Ron Larson of the University of Maryland. The second is published by Billy Barron of the University of North Texas and is called *Accessing On-Line Bibliographic Databases.* Instructions for obtaining each are shown below. I have also provided instructions that describe how to obtain a very helpful document, "canada.lib", which is discussed below.

You should be aware that the various INTERNET guides provide outdated directions for obtaining the University of North Texas document. The following are the correct sequences for obtaining both publications. The text that you type is preceded by a pointing hand (☛).

INTERNET-Accessible Library Catalogs and Databases

```
gpu.utcs%                                     ☛ ftp ariel.unm.edu
Connected to ariel.unm.edu.
220 ariel.unm.edu FTP server (ULTRIX Version 4.1 Tue Mar 19 00:38:17 EST 1991)
 ready.
Name (ariel.unm.edu:herb):                    ☛ anonymous
331 Guest login ok, send ident as password.
Password:                                     ☛ Herb                    (Type your logon id)
230 Guest login ok, access restrictions apply.
```

```
ftp>                                         ☛ cd library
250 CWD command successful.
ftp>                                         ☛ get internet.library
200 PORT command successful.
150 Opening data connection for internet.library (128.100.100.1,3003) (281037
 bytes).
226 Transfer complete.
289409 bytes received in 56 seconds (5.1 Kbytes/s)
ftp>                                         ☛ quit
221 Goodbye.
```

Accessing On-Line Bibliographic Databases

```
gpu.utcs%                                    ☛ ftp ftp.unt.edu
Connected to mercury.unt.edu.
220 mercury FTP server (SunOS 4.1) ready.
Name (ftp.unt.edu:herb):                     ☛ anonymous
331 Guest login ok, send ident as password.
Password:                                    ☛ Herb                (Type your logon id)
230 Guest login ok, access restrictions apply.
ftp>                                         ☛ cd library
250 CWD command successful.
ftp>                                         ☛ get canada.lib
200 PORT command successful.
150 ASCII data connection for canada.lib (128.100.100.1,3060) (8628 bytes).
226 ASCII Transfer complete.
8964 bytes received in 2.2 seconds (4 Kbytes/s)
ftp>                                         ☛ get libraries.txt
200 PORT command successful.
150 ASCII data connection for libraries.txt (128.100.100.1,3066) (293008
 bytes).
226 ASCII Transfer complete.
303808 bytes received in 1.7e+02 seconds (1.8 Kbytes/s)
ftp>                                         ☛ quit
221 Goodbye.
```

The "canada.lib" document is not listed in any of the reference publications currently available about the INTERNET, but it does contain much that is relevant to Canadians. Because of this significance, it is included in this article:

```
            'canada.lib'

I understand you have an interest in online library catalogues which are accessible via the
Internet.

In the course of my work as a reference librarian I, too, work with remote online library
catalogues.  Over the last year I have been collecting Internet addresses for Canadian
library catalogues and I am always looking for new additions, particularly those which are
not published in the Billy Barron or Art St. George lists.
```

You may discover in my list below some catalogues of which you were previously not aware. If you know of other Canadian catalogues I would be delighted to hear about them.

john sadler

Canadian Internet -Accessible Libraries

This document contains a handy list of some 21 online library catalogues in Canada accessible via the Internet . Each entry gives basic information about the catalogue: 1) name of the institution, 2) name of the online catalogue service, 3) command to use (either telnet or tn3270), 4) Internet address, 5) special instructions, and 6) directories where the catalogue is listed. Although some of these addresses are available through other sources, many remain unpublished.

For additional information on Internet -accessible libraries there are a number of international directories which may be of interest. Beyond the name of the institution and the Internet address, these directories frequently provide a contact person and more detailed signon instructions.

The two most popular directories are known colloquially as the Billy Barron list and the Art St. George list. Billy Barron of the University of North Texas publishes "UNT's Accessing On-Line Bibliographic Databases", (current version May 30, 1991). Art St. George of the University of New Mexico, publishes "Internet-Accessible Library Catalogs & Databases" (current version April 16, 1991). Coverage is similar, though the format and degree of detail of the directories are different. They describe some 200 library catalogues, mostly in the United States but with selective listings for Canada, the United Kingdom, Australia, New Zealand, Mexico, Israel and Germany.

The Internet guide for Australia is called "AAARNet Resource Guide" and the title for the United Kingdom is, "OPACS in the UK". All four of these directories may be downloaded from the University of North Texas computer. Files are available via anonymous file transfer protocol (FTP) on ftp.unt.edu. All files are located in the "library" subdirectory.

Canadian Internet Accessible Libraries

(last updated 15 June 1991)

The notation, "listed in BB", means the catalogue is included in the Billy Barron list. Similarly, "listed in ASG" indicates the catalogue is described in the Art St. George list.

Signing on to a Catalogue

For example, signing on to the catalogue at Queen's University:

```
telnet 130.15.125.20
```

For example, signing on to the catalogue at the University of Calgary:

```
tn3270 develnet.ucalgary.ca
```

Institution: Brandon University
Service: BuCAT
Command: telnet or tn3270
Address: library.brandonu.ca
Instructions: At the "Username:" prompt, enter libcat .
Directory: listed in BB

Institution: Dalhousie University
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: McGill University
Service: MUSE
Command: tn3270
Address: mvs.mcgill.ca or 132.206.27.5
Instructions: At the "SELECTION" prompt, enter 2 .
Directory:

Institution: McMaster University
Service:
Command: tn3270
Address: 130.113.0.59
Instructions: Tab to the "COMMAND" prompt.
Enter dial vtam .
At the "ENTER YOUR LOGONID" prompt, enter super .
At the "ENTER PASSWORD" prompt, enter session .
At the the "SNA SYSTEMS INTERCONNECT" screen, enter s .
At the "Service Selection Screen", press F9 .
At the "SUPERSESSION Application Selection" screen,
press F3 .
Directory:

Institution: Mount Allison University
(Sackville, N.B.)
Service: ATLAS
Command: telnet or tn3270
Address: 138.73.1.1
Instructions: At the "Username:" prompt, enter catalog .
Directory:

Institution: Mount Saint Vincent University
(Halifax, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: Nova Scotia College of Art and Design
(Halifax, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: Queen's University
Service: QLINE
Command: tn3270
Address: 130.15.125.20
Instructions:
Directory: listed in BB and ASG

Institution: Saint Mary's University
(Halifax, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: Technical University of Nova Scotia
(Halifax, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: University College of Cape Breton
(Sydney, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

Institution: University of British Columbia
Service: UBC library
Command: telnet or tn3270
Address: library.ubc.ca
Instructions: Requires id and password from the university
Directory:

Institution: University of Calgary
Service: Libraries Online
Command: telnet or tn3270
Address: develnet.ucalgary.ca or 136.159.1.70
Instructions:
Directory: listed in BB and ASG

Institution: University of Kings College
(Halifax, N.S.)
Service: Novanet
Command: telnet
Address: novanet.dal.ca
Instructions:
Directory:

INTERNET NOTES

Institution: University of New Brunswick
Service: PHOENIX
Command: tn3270
Address: 131.202.1.2
Instructions: At the "University of New Brunswick" welcome screen, enter 8 .
Directory: listed in BB and ASG

Institution: University of Prince Edward Island
Service:
Command: telnet or tn3270
Address: lib.cs.upei.ca
Instructions: At the "Username:" prompt, enter bobcat .
Directory:

Institution: University of Saskatchewan
Service:
Command: telnet or tn3270
Address: skdevel2.usask.ca or skdevel.usask.ca
Instructions: At the "REQUEST" prompt, enter lib .
Directory: listed in BB and ASG

Institution: University of Toronto
Service: FELIX
Command: telnet or tn3270
Address: 128.100.100.32
Instructions: At the "BRANCH:" prompt, enter ROBARTS [must be in caps], or other branch library from list displayed.
Directory: listed in BB and ASG

Institution: University of Victoria
Service:
Command: telnet or tn3270
Address: uvvm.uvic.ca or 128.189.65.3
Instructions: Requires id and password from the university
Directory:

Institution: University of Western Ontario
Service:
Command: telnet
Address: geac.lib.uwo.ca or 129.100.2.18
Instructions:
Directory:

Institution: York University
Service: YORKLINE
Command: telnet or tn3270
Address: yorkline.yorku.ca or 130.63.1.10
Instructions: Enter
Directory: listed in BB

This information was current and accurate as of 15 June 1991. Signon procedures vary from system to system and are subject to change without notice. Addresses have been gathered from various printed sources and through personal contacts. Please notify me of any corrections or additions.

```
+-------------------------------------+
|   John Sadler                       |  Faculty of Law Library          |
|   Reference Librarian               |  University of New Brunswick     |
|   Internet:  jsadler@unb.ca         |  Bag Service 44999               |
|   Tel.  (506) 453-4734              |  Fredericton, New Brunswick      |
|   Fax.  (506) 453-5186              |  Canada, E3B 6C9                 |
|------------------|------------------+
```

If you have any questions or comments about this article, please write to *herb@gpu.utcs.utoronto.ca*.

Microcomputer Short Courses

Irene Rosiecki
rosiecki@vm.utcs.utoronto.ca

UTCS offers various noncredit microcomputer courses to faculty, staff, and graduate students of the University of Toronto. These courses cover a number of software programs available for the PC or the Macintosh. Whether you will be typing a thesis on a word processor, or working with spreadsheets, databases, or desktop publishing, we may be able to help you get started.

Our class sizes are small to allow for much individual attention. In most cases, continuing support is available upon completion of a course.

The following is a list of the microcomputer courses taught at UTCS:

- Introduction to dBASE IV
- Introduction to Disk Operating System (DOS)
- Electronic Mail Seminar
- Excel on the Macintosh
- Introduction to FoxBASE+/Mac 2.0
- Introduction to HyperCard
- Introduction to Lotus 1-2-3
- Introduction to PageMaker
- ProComm Communications Seminar
- Introduction to SAS on the PC
- Intermediate SAS - Data Processing
- Intermediate SAS - Statistics
- SAS/Graph Seminar
- Microsoft Word on the Macintosh
- Introduction to WordPerfect 5.1
- Advanced WordPerfect 5.1 Topics

To find out about course dates and registration procedures, or to book a place in any of these courses, please contact Irene Rosiecki at 978-4565. Courses are filled on a first-come, first-served basis. The more popular courses fill up quickly, but waiting lists are maintained in case of cancellations.

Computing & Communications Annual Report

The Department of Planning and Coordination has prepared an Annual Report outlining projects completed by all departments in the Division of Computing and Communications during the 1991/92 fiscal year. The Report, which was distributed early in May, was circulated to Principals, Deans, Directors, and Chairs of departments. If you did not receive a copy but would like to see one, call Eva Swenson at 978-5138, or send electronic mail to the address below.

Eva Swenson
eswenson@vm.utcs.utoronto.ca

Changes to Voice Mail with New Release of Software

In May, UTVC installed a new release of software to the Integrated Voice Messaging Systems (IVMS) on the Erindale, Scarborough and St. George campuses.

The major difference to voice mail users was a change in their mailbox number. When the voice mail systems were originally installed, the last four digits of the user's telephone number were used as the mailbox number. Problems were encountered when new telephone numbers starting with "0" on the St. George campus were assigned. When a caller who is using a mailbox presses "0" on the touchtone dialling pad, "Jane" thinks they are looking for help or want to speak to a live human being. This situation did not accommodate IVMS users with a telephone number starting with "0".

Effective with the installation of the new software, IVMS users' mailbox numbers have five digits. At the St. George campus, mailboxes start with "2" and end with the last four digits of the user's telephone number. For example, if the user's telephone number is "2324" , the new mailbox number will be "22324". Although telephone numbers at Erindale and Scarborough do not start with "0", mailbox numbers have also changed to accommodate future IVMS networking capability. Mailboxes at Erindale begin with "8" and are followed by the last four digits of the telephone number; at Scarborough, they begin with "7" and are followed by the last four digits of the telephone number. Individual mailbox users and the departmental contacts responsible for voice mail bulletin boards were advised by memo of their new mailbox number.

This change in mailbox numbers will affect all voice mail users. When retrieving your voice mail messages from a telephone other than your own, you will have to key in your new five-digit mailbox number rather than your four-digit telephone extension. When sending voice mail messages to other voice mail users, you will have to remember to use their five-digit mailbox numbers rather than their four-digit telephone extensions. Also, you will have to update any "group lists" you may have created to use the new five-digit mailbox numbers.

As always, if you would like more information about IVMS, you can contact Ann McLean at 978-1723 or mailbox number 21723.

Debbie Stewart
Voice Communications

Statistical Software News

Sandra Gardner
sgardner@vm.utcs.utoronto.ca

SAS NEWS

UTCS is considering the permanent removal of the SAS/OR (operations research) module from SAS under CMS effective July 1992. If this action would adversely affect your use of SAS under CMS, please call me at 978-5128.

SYSTAT NEWS

UTCS will no longer be offering a SYSTAT version 3.2 site licence for Macintosh computers since SYSTAT, Inc. is no longer selling documentation for this version. SYSTAT version 3.2 is the older version of the product which required only one megabyte (MB) of Random Access Memory (RAM).

If you have 2MB of RAM or more, you can always install SYSTAT version 5.1 which is a much better version of this product. Please call the Information Office at 978-4990 for site licence details.

BMDP NEWS

The BMDP 1990 version is now available under CMS. There are two new programs, namely, LE for maximum likelihood estimation and PR for polychotomous logistic regression. There is a major upgrade to the CA program for correspondence analysis, and enhancements to many other programs.

The CMS command GETME will access the several versions of BMDP in the following way:

Command	**Version**
getme bmdp old	BMDP 1985
getme bmdp	BMDP 1987
getme bmdp new	BMDP 1990

You may run BMDP interactively, in batch, or access the procedures through SAS using PROC BMDP and the SAS BMDP EXEC.

The BMDP Statistical Software Manual (volumes 1 and 2) for the 1990 version are available through the University of Toronto Bookstore.

I also have a copy of the BMDP Communications newsletter which contains a special insert entitled *ANOVA in the BMDP V Series Programs*. If you would like a copy of this article or have general questions about BMDP, please call me at 978-5128.

Please remember that BMDP receives a low level of support from UTCS. If you require technical assistance please call the BMDP technical support line at 1-310-479-7799 and identify yourself as a user at the University of Toronto site.

To reach other BMDP users, you may join the electronic mail discussion list for BMDP users by entering the following CMS command:

```
tell listserv at mcgill1 subscribe bmdp-l
<your name>
```

OSA90:

Optimization Software for Engineering Applications

Andrzej J. Pindor
pindor@breeze.utcs.utoronto.ca

OSA90 (Optimization Shell Assembly) is an optimization package that runs on Sun and Hewlett-Packard workstations. The package is designed to handle situations where a function (or functions) of one or two variables is to be optimized with respect to a set of parameters.

OSA90 can perform three types of tasks: simulation, optimization (using proprietary gradient-based optimizers – minimax, l1 and l2), and statistical analysis of the system behaviour.

Although the program provides an environment for composing mathematical formulae and functions, the real strength of the program lies in its unique Datapipe construct. Datapipe allows connections between OSA90 and external programs. For complex problems, you can delegate the task of performing numerical calculations to an external program that receives input from OSA90 through a high-speed data connection and sends its output to OSA90 the same way.

Essential information that specifies the problem you wish OSA90 to analyze and optimize is contained in an ASCII text file called an input file. OSA90 has a built-in full-screen editor that allows you to create, retrieve, modify, and save input files. The editor is integrated with the file parser for pinpointing syntax errors in the input file.

The contents of the input file are divided into sections called blocks. The block names and their descriptions are summarized below:

EXPRESSION	defines constants, variables, formulae, responses, Datapipes, and so on;
SWEEP	defines simulation ranges, sweep parameters, and output labels;
SPECIFICATION	defines ranges, functions, goals, and weights for optimization;
STATISTICS	defines correlation matrices for statistical variables;
MONTECARLO	defines ranges, responses, and goals for Monte Carlo analysis.

To specify formulae and functions, you can use a full complement of algebraic operators and elementary functions. The program supports conditional structures of the form "if...else," as well as arrays. The maximum length of an array is 1024.

When you submit an input file to OSA90 for processing, the program will present a menu that offers the choice of the task to be performed. If, however, the input file lacks a particular block – Monte Carlo, for instance – the corresponding menu option will be disabled. You can also choose another input file or a macro file (see below). When you choose any of the options, the program will invoke an appropriate submenu where you must specify some additional details. For instance, in the case of optimization, you must choose an optimizer (minimax, l1 or l2), the maximum number of iterations, and the accuracy of the solutions. If you have not found a satisfactory solution after the maximum number of iterations, you can perform additional iterations, starting from the most recent values of optimization variables.

An interesting addition to the optimization capabilities is sensitivity analysis. This shows changes to the objective function when optimization variables are perturbed around some nominal values. If there are many variables, this may help you to choose the most influential ones.

Monte Carlo analysis simulates the statistical behaviour of the system in the presence of parameter tolerances, input level fluctuations, and other statistical uncertainties. Statistical models available to users include uniform, normal (Gaussian), lognormal, and exponential distributions, and any combination of these. In the case of multidimensional normal distributions, parameter correlations can also be accommodated.

The program has a graphics routine that is used to present the results of simulations, sensitivity analysis, or Monte Carlo analysis. You can print hard copies of graphical displays on various Hewlett-Packard printers. You can also save graphics images to a file in Hewlett Packard's Printer Command Language (PCL) format.

To get a feeling for how the program works, I tried it on the following simple problem: given a set of points in 3D space, find the best second degree surface approximating these points; the x and y coordinates of the points form a 7 x 7 mesh.

I approached the problem in two ways. First I included the numbers specifying the points in the input file and allowed OSA90 to perform all the calculations. Using an l2 optimizer (i.e., least-square fit), the program found the optimum values of the six parameters in six iterations that took three seconds. In the second approach I used an external C program to read the points from a file and to calculate a distance from the surface for each of them. Then I used Datapipe to pass each of these distances to OSA90 as error functions to use in constructing an objective function. It took 20 seconds to reach the (same) minimum in this case. The reason that it took longer is, of course, due to the fact that for each iteration the Datapipe had to be activated 49 times to pass the current values of parameters from OSA90 to the C program, and for the C program to pass back the corresponding error functions. The calculation of the error function is trivial in this case, so most of the time is spent passing information between the C program and OSA90. In more realistic cases the overhead due to the Datapipe connection would probably be not so significant. On the other hand, due to a limited maximum size of arrays in OSA90 (1024), any problem that requires working with large arrays would have to involve an external program and a Datapipe connection.

OSA90 performs all computations in single precision. For many problems this is satisfactory, but in some cases single precision may not be sufficient. The program clearly originated from its authors' work in the area of circuit design and optimization, and for problems in this area single precision accuracy is presumably completely satisfactory. However, for more general applications, it would be advantageous if the program were able to perform computations in double precision.

The structure of the input file and the syntax of OSA90 commands may seem a bit unusual at first, but it does not take long to figure out how to formulate a problem in OSA90 language. Once you have done this and submitted the input file, the menu-driven interface takes over. All that is left to you is to choose the desired options from the menus and submenus. The menu structure of OSA90 is very transparent, but I wish it was better designed graphically.

You can use special macro command files to operate the program in an automated, unattended fashion if you want to solve a problem so time-consuming that interactive use would be inconvenient.

The program is accompanied by a set of demonstration files that give examples of input files for various problems and templates for C programs invoked through Datapipe. These templates (together with full examples of such programs) are a good introduction if you want to write your own applications using Datapipe.

Vendor:
Optimization Systems Associates Inc.
P.O. Box 8083, Dundas, Ontario
L9H 5E7
(416) 628-8228

Hardware Requirements:
Sun SPARCstation I, I+, II, Sun 4/xxx, HP 9000 series;
Colour monitor with 1152x900 or higher resolution

Price:
First copy: CDN$1250
Copies 2-6: CDN$250 each (academic price).
It is possible to arrange further discounts in the case of larger orders.

No-Obligation Trial for Visualization Software from IMSL

Andrzej Pindor
pindor@breeze.utcs.utoronto.ca

IMSL/IDL is interactive visualization software that allows you to view data in ways you may have never thought possible. It includes two- and three-dimensional plots, mathematics, statistics, signal processing, animation, volume rendering, and image processing. A built-in widget toolkit lets you customize the graphical user interface.

Through June 15, 1992, you can try IMSL/DL on your workstation if you are a University of Toronto employee. Call Andrzej Pindor at 978-5045 to make the necessary arrangements.

Maple Corner

News for Maple Users at U of T

Using Maple for Engineering Design and Analysis

Andrzej Pindor
pindor@breeze.utcs.utoronto.ca

Computers have a well-established role in engineering as tools for "number crunching." After spending considerable time developing appropriate equations and models, an engineer would then have a computer calculate the final answers. Maple's symbolic capabilities also make it a great help in the development of models. Not only can Maple eliminate much of the tedium inherent in many complex engineering models, but it can also increase confidence in the results since many routine formal mathematical tasks will be performed without errors. In essence, having Maple is like having very bright, mathematically knowledgeable assistant to help you with the mathematics of your analysis and design problems. Listed below are examples of Maple's engineering applications. This information appeared in a publication of Waterloo Maple Software's "Maple for Engineering Design and Analysis" by T. Lee and G.P. Porciello. To obtain a copy of this publication from UTCS, call Andrzej Pindor at 978-5045. The aforementioned publication contains the following case studies:

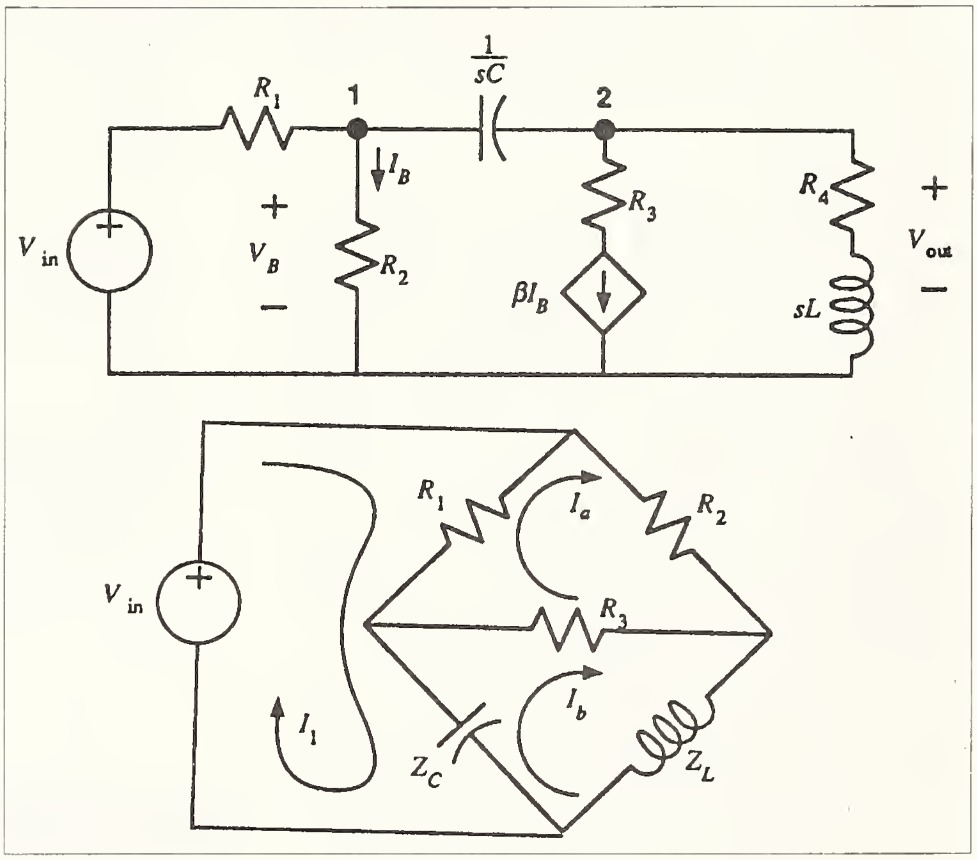

Figure 1: the networks to the right are analyzed.

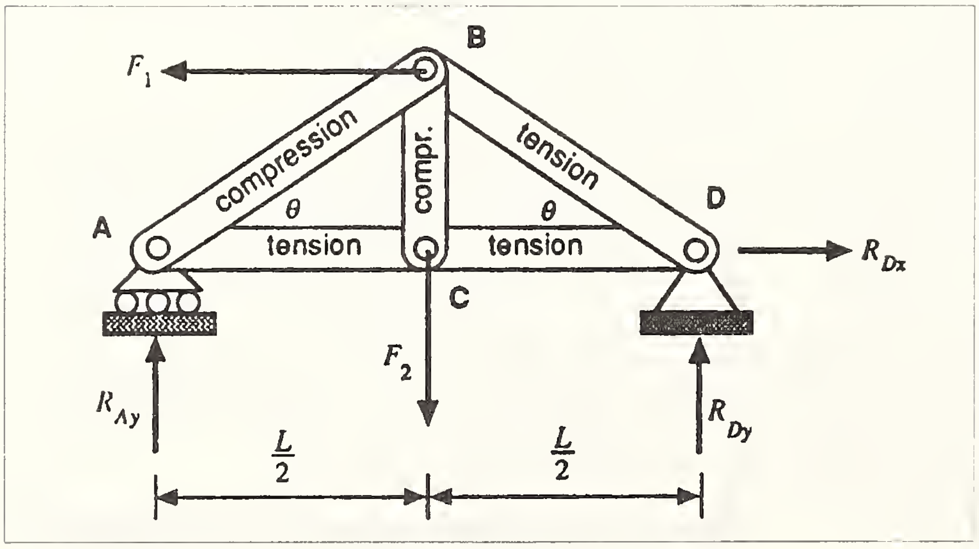

Figure 2: truss analysis.

- Applications in network analysis;
- Applications in statics;
- Applications in kinematics;
- Analog and digital filter design;
- Applications in solid mechanics (plasticity);
- Classical control systems design and analysis;
- Optimal control systems design and analysis;
- Advanced dynamics.

In the first of the above case studies, the two electrical networks shown in *Figure 1* are analyzed. The aim is to develop transfer functions for these networks.

In the second of the above case studies, Maple tackles three problems in static equilibrium analysis of structures: truss analysis in *Figure 2,* deformation due to temperature change in *Figure 3,* and elastic deflection of beam in *Figure 4.*

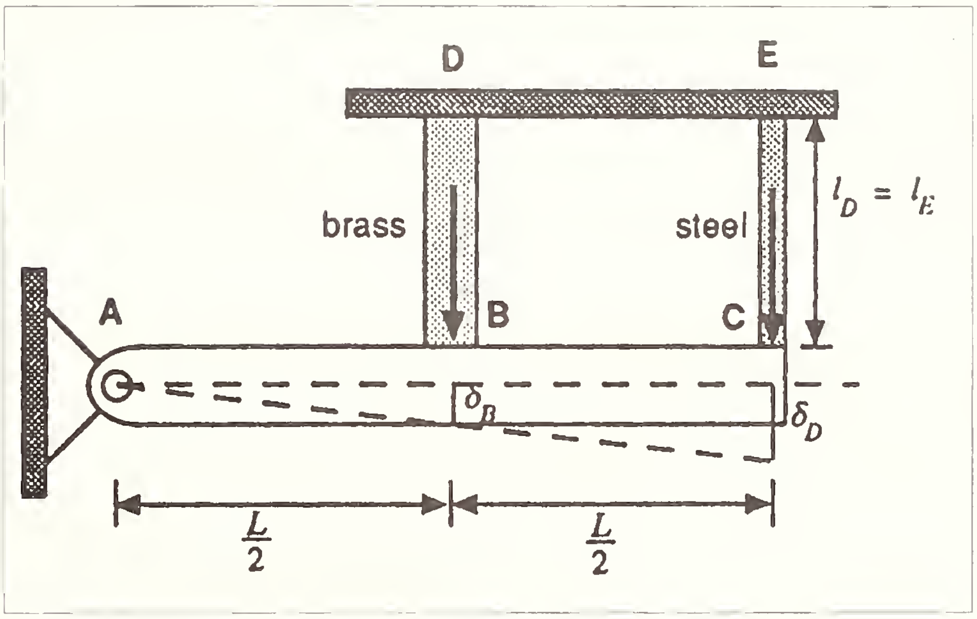

Figure 3: deformation due to temperature change.

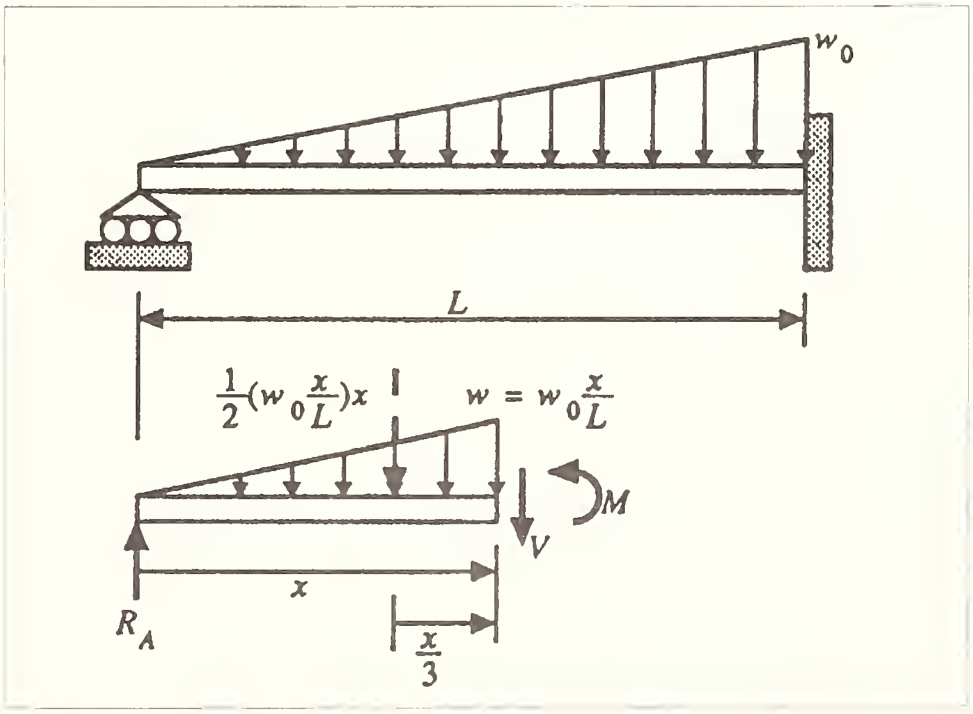

Figure 4: elastic deflection of beam.

Maple V Now Supports DEC AVS

You can now link Maple V running on Digital systems to AVS 3.0. This will allow you to conceptualize interactively your mathematical models through the superior visualization capabilities of DEC AVS. Likewise, this link gives DEC AVS users the opportunity to tap into Maple's vast pool of mathematical knowledge. If you use DEC AVS on Digital systems running Ultrix, and you are a University of Toronto employee, you can acquire a University of Toronto site licence for Maple. If you are interested in more details, call Andrzej Pindor at 978-5045 or send electronic mail to *pindor@breeze.utcs.utoronto.ca.*

Maple Library of User Contributed Programs

When you receive your Maple software, you will also receive a number of procedures that have been contributed by various users. These procedures are located in the "share" subdirectory on UNIX systems.

Below is a short description of some of the packages:

Package	Description	Authors
cartan	Finds connection and curvature using Cartan's equations	S. Allen, R. G. McLenaghan
cgsolve	Solves polynomial equations using Cr and Gregoff's	P. Savich
debever	Finds Newman-Penrose quantities using Debever's formalism	S. Allen, G. J. Fee, A. Kachura, F. W. Letnioski
eq	Wraps long lines in eqn	R. Balogh
galois	Computes galois groups of polynomials	J. McKay, R. Sommeling
gcamd	Calculates derivatives	M. Dyman
lattice	Finds a reduced basis for a lattice	J. McKay, R. Sommeling
mapletnsr	Tensor package	S. Allen, C. Dyer, J. Harper
oframe	Orthonormal Tetrad package positive tests a polynomial to see if its values are all positive	N. Van den Bergh J. Dinovitzer, R. G. McLenaghan
petrov	Finds the petrov type of a Weyl tensor	F. Letniowski, R. G. McLenaghan
positive	Tests a polynomial to see if its values are all positive	J. Dinovitzer, R. G. McLenaghan
traubjen	Find polynomial complex roots	

If you write a procedure or package yourself and you think it might be of interest to others, you may wish to contribute it to the library. You can send your code and documentation to:

gjfee@watmum.waterloo.edu
watmath!watmum!gjfee.uucp
gjfee@watmum%waterloo.csnet
gjfee@watmum%waterloo.bitnet

or

Greg Fee
Symbolic Computation Group
Department of Computer Science
University of Waterloo
Waterloo, Ontario N2L 3G1
Canada
(519) 885-1211 (x4474)

The most recent contributions to the "share" library can be obtained via anonymous File Transfer Protocol (FTP) at the University of Waterloo. The address is *daisy.uwaterloo.ca* (IP number 129.97.140.58).

Maple V Available on NeXT

If you are a University of Toronto employee with a NeXT computer and would like to run Maple, you can purchase a University of Toronto site licence. The price is CDN$200. For more details, call Andrzej Pindor at 978-5045 or send electronic mail to *pindor@breeze.utcs.utoronto.ca*.

Procedures to Plot Solutions of Differential Equations

An interesting Maple procedure recently was made available by George Labahn from the University of Waterloo. This procedure, "plotDE", plots solutions of differential equations. For example, the following command

```
plotDE({ diff(y(x),x) = sin(x*y(x)),y(0)=2},y(x),0..6,labels=[x,y]);
```

will plot a solution of the equation y'(x) = sin(x*y(x)) (with initial condition y(0)=2), for x between 0 and 6. The procedure can also plot solutions to a system of differential equations, for instance:

```
sys := diff(y(x),x)=z(x),diff(z(x),x)=y(x):  fcns := {y(x), z(x)}:
plotDE({sys,y(0)=0,z(0)=1}, fcns,-4..4,numpoints=25);
```

Figure 5 shows a PostScript plot of the solutions to this system of equations.

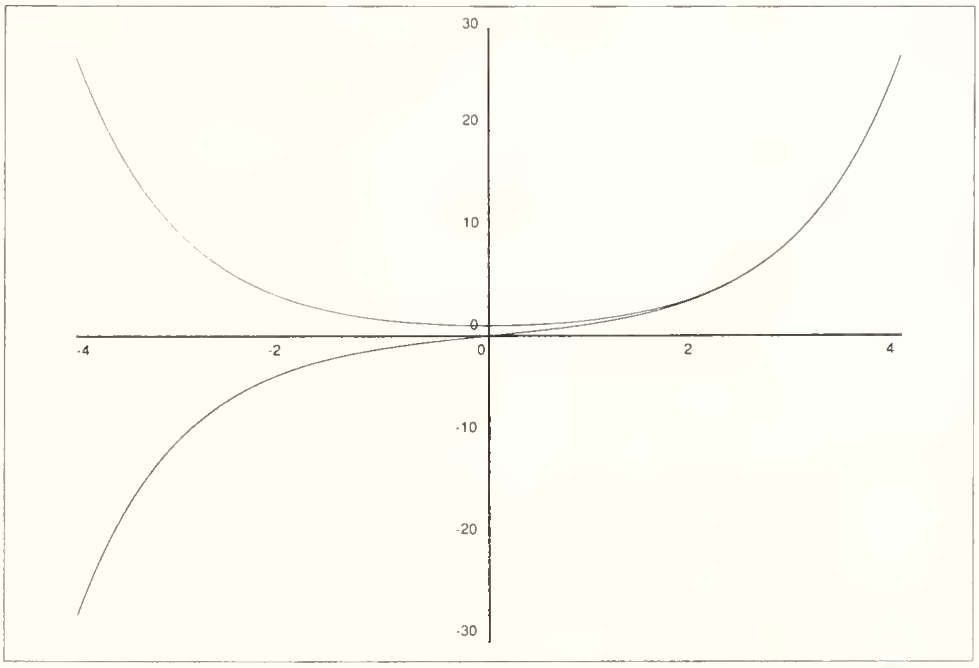

Figure 5

Fix for pointplot

The UNIX version of pointplot, the Maple procedure that is supposed to plot separate points, has a bug. When you try to create a PostScript file of the graph, the printer produces a series of lines that cross where the points are supposed to be. One Maple user wrote a simple program that corrects the PostScript file:

```
------------------------
#!/bin/awk -f
# make thicker dots
/tthick 1 def/{
        $2 = 5
        print
}
# print dots
/newpath tthick setlinewidth/{ print
        getline
        getline
      y = $2
        getline
        getline
        x = $1
        print x, y, "m"
        print x, y, "l"
        next
}
{ print }
-----------------------------
```

where the number "5" in "$2 = 5" determines the size of the dots. Assuming that the program is in a file called "fixplot", you use it as follows:

```
fixplot <raw.plot >good.plot
```

where "raw.plot" is a PostScript file from Maple and "good.plot" is a resulting file that you send to a PostScript printer. Works like a dream!

UTCS Services

The mission of Computing and Communications (UTCC) is to provide services, facilities, and expertise that ensures that the University of Toronto is a leader in the cost-effective utilization, management and evolution of information technology in support of the research, teaching, library, and administrative goals of the University.

Facilities Managed by UTCS

Administrative Computing
- administrative ORACLE, IMS, DB2, TS0, Batch
- 3081K processor, 48 megabytes of memory
- MVS/XA operating system

Computer Disciplines Facility/PC
- 88 NEC computers connected in a Local Area Network:
  - •Robarts Library (Rm. 1061A): 36 NEC PCs
  - •St. Michael's College (Rm. 107): 26 NEC PCs
  - •Sidney Smith (Rm. 1071): 23 NEC PCs
  - •Trinity College (Rm. 024): 3 NEC PCs
- MS-DOS with Turing environment
- introductory computer science

Computers In Quantitative and Empirical Science Teaching (CQUEST)
- 52 DEC VT1000 X Window terminals, 20 DEC 2100 workstations connected in Local Area Network:
  - •Ramsay Wright (Rm. 211, 213): 29 DEC VT1000s, 10 DEC 2100s
  - •Sidney Smith (Rm. 2105): 20 DEC VT1000s, 10 DEC 2100s
  - •Departmental use: 3 DEC VT1000s

Public Sites
- 50 XT100 terminals connected to PACX
  - •Robarts Library (Rm. 1061A): 24 terminals
  - •Engineering Annex (Rm. 107B): 12 terminals
  - •St. Michael's College (Rm. 107): 9 terminals
  - •Victoria College (1st floor): 3 terminals
  - •Trinity College (Rm. 024): 2 terminals

Erindale College Systems
SUN 3/280, 16 megabytes of memory
- instructional and research access using UNIX

VAX 8200, 8 megabytes of memory
- instructional access using VMS
- research access

UTCS Centrally Owned and Managed

Systems

IBM VM/CMS
Technical Assistance: 978-6602
- General Purpose Timesharing environment
- Hub of the NetNorth network with access to BITNET, EARN and the Internet
- 4381-R03 processor with 32 megabytes of memory
- CP operating system, VM/SP HPO R6
- CMS timesharing system, VM/SP Release 6
- FTP and TELNET access to the campus Ethernet, as well as Internet
- RSCS spooling system, Release 2.3

GP UNIX
Technical Assistance: 978-8853
- General Purpose Timesharing under SUN UNIX 4.1.1
- SUN 4/490, 32 megabytes of memory
- access to Linotronic typesetter
- full access to USENET, an electronic technical information exchange facility
- full access to the Internet, UUCPNET, BITNET, CDNNET

Services

Facility Management Support
Primary Phone: 978-5050
- Installs, maintains and upgrades microcomputer systems, particularly Macintoshes, IBM PCs and compatibles on a contract basis or on a cost-per-call basis.
- Provides institutional sales for approved personal computer equipment
- Provides management of computing facilities and local area networks for local office systems and undergraduate facilities

Network Development & Support
Primary Phone: 978-7087
- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.
- provides access between the IBM systems and machines using UNIX, VMS, and other operating systems. Ethernet, Pronet, and IBM TRN technologies are used over various transmission media including optical fibre. More basic communications techniques are also used for moderate speed links.
- provides consulting on local area networking
- provides access to NetNorth (BITNET), the North American Universities Network; ONET, the Ontario Regional Network; CA*net, the Canadian National Network; and USENET, the UNIX networking fraternity
- will provide a communications solution to department needs on a contractual basis

User Support Services
Advising and Consulting
Primary Phone: 978-HELP
- The Advising and Consulting group is available to University faculty, staff, and graduate students.
- provides phone-in advising, and consultations by appointment for the following products;
  - operating systems: DOS, Macintosh System & Finder
  - packages and libraries: SAS, SPSS, SYSTAT
  - word processors: WordPerfect, Microsoft Word
  - databases: dBASE IV, FoxBASE
  - spreadsheet: Lotus 1-2-3, Microsoft Excel
  - file transfer: ProComm, MacKermit
  - electronic mail: QuickMail

Information Technology Support
Primary Phone: 978-5601
- selection consulting for hardware and software
- Micro Lab for evaluation of hardware and software
- CD-ROM access to software and information discs
- offers phototypesetting service

Administration and Information Services
Primary Phone: 978-4462
- administers Local Area Network of PCs for Education Facility
- administers Macintosh Education Facility
- administers site licences for various software packages
- provides short courses and seminars on the more popular services and software packages
- provides accounting services for all UTCS services
- provides accounting services for the University's telephone system on behalf of the Voice Communications Department
- produces *ComputerNews*, the *Computing & Communications Newsletter*, and assists in the production of the UTCC Annual Report

Telephone Listings

Consulting and Enquiries

Account & Access Code Enquiries	Jason Pante	BC101B	978-7148
Communication, Networking & Hardware	Rosi Derka-Tseu	BC105	978-7087
Erindale College	Joe Lim	ER2035	828-5311
IBM & Macintosh Maintenance	Rosi Derka-Tseu	BC103	978-1299
Information Office / Site Licences	Evelyn Ward	BC201	978-4990
Tape Library (Academic Services)	Susan Kovago	MP368	978-7319
Tape Library (Administrative Services)	Miranda Fong	MP368	978-6693
UTCS Noncredit Short Courses	Irene Rosiecki	BC217	978-4565

Consulting & Advising Services:	978-HELP
CMS, and GP UNIX userids:	ADVISOR
CMS Userid for mail problems:	POSTMSTR
Network Operations Centre	978-4621
System Status Enquiries (GP UNIX)	978-4318
System Status Enquiries (IBM)	978-7393
Interactive Services 300 (bps)	978-3959
Interactive Services 1200 (bps)	978-395
Interactive Services 2400 (bps)	978-7239
Interactive Services 9600 (bps)	978-7220

UTCS Directory

Management Office General Enquiry				978-4462
Director:	Dr. Warren Jackson	BC118	978-8948	wcj@vm.utcs.utoronto.ca
Associate Director, Operations:	Eugene Siciunas	BC116	978-5058	eugene@vm.utcs.utoronto.ca
Managers:				
Computer & Network Operations Support	Dr. Bob Chambers	MP350	978-7092	bob@utcs.utoronto.ca
Systems Support	Bill Lauriston	MP350	978-3579	bill@utcs.utoronto.ca
Facility Management Support	Vera Cabanus	BC312A	978-7107	vcabanus@gpu.utcs.utoronto.ca
User Support Services	Don Gibson	BC312	978-7331	gibson@utcs.utoronto.ca
Network Development & Support	Norman Housley	BC121B	978-4967	norman@vm.utcs.utoronto.ca
Administration & Information Services	Ron Vander Kraats	BC121A	978-4428	rvk@vm.utcs.utoronto.ca

Legend:
BC = Bancroft Building
ER = Erindale
MP = McLennan Physical Labs

* NetNorth/BITNET/EARN

Terminal & Advising Sites

Names and Locations

Central Advising Office (CAO), 978-HELP
Engineering Annex (EA), 11 King's College Road, Room 107B
Erindale College (Erin), 828-5339, 3359 Mississauga Road North, Erindale Campus, Rooms 2037, 2045
Ramsay Wright, 25 Harbord St., Rooms 211, 213
Robarts, Robarts Library, 130 St. George St., Room 1061A
Sidney Smith (Sidney), 100 St. George St., Room 1071, 2105
St. Michael's College, 121 St. Joseph St., Room 107
Trinity College, 6 Hoskin Ave., Room 024
Victoria University, 73 Queen's Park Cres., 1st floor

Access Hours

Sites	Hours of Access				Restrictions*	Advising
	Mon-Thurs	Fri	Sat	Sun		
CAO	12:00-18:00	12:00-18:00	closed	closed	Research	978-HELP
EA	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Erin (2045)	9:00-22:00	9:00-22:00	12:00-18:00	12:00-18:00	None	Rm 2005
Ramsay Wright	7:00-21:00	7:00-18:00	closed	closed	Undergrads	No
Robarts	8:30-24:00	8:30-24:00	9:00-22:00	13:00-22:00	None	978-HELP for Research
Sidney	7:00-24:00	7:00-24:00	7:00-24:00	7:00-24:00	None	978-HELP for Research
St. Michael's	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Trinity	8:00-22:00	8:00-22:00	8:00-22:00	8:00-22:00	None	978-HELP for Research
Victoria	8:30-21:00	8:30-21:00	8:00-13:00	8:00-13:00	None	978-HELP for Research

Sites	Advising Hours
CAO	Monday through Friday, 12:00 - 18:00
Erin	Monday through Friday, 09:00 - 22:00

* Research includes graduates, faculty, staff

Computer and Printer Access

Sites	PACX	CDF/PC	CQUEST	Printers
EA	Y			Y*
Erin	Y			Y*
Ramsay Wright			Y	Y**
Robarts	Y	Y		Y*
Sidney		Y	Y	Y**
St. Michael's	Y	Y		Y*
Trinity	Y	Y		
Victoria	Y			

(Y=yes, N=no)
* Public Printers **Site Only

UTCS Site Licences

UTCS administers a number of software site licences available to the University of Toronto community. (Usually, this means faculty, staff, and graduate students, though some licences apply to undergraduate students also. See "Restrictions" in the table below.) The licences provide a variety of software at much-reduced cost. The majority of the licences must be renewed each year. Most are terminated when you leave U of T.

Each licence has a contract that you must complete. It outlines your responsibilities and any limitations in the use of the software. All contracts and software are available from the UTCS Information Office, 4 Bancroft Avenue, Room 201. To qualify as a member of the U of T community, you must provide a valid Employee number or Student number.

The table below describes the available site licences. The Restrictions column specifies who may purchase the licence. If the restriction is Research, the payment must come from research money. The Diskettes/Distribution column describes how you actually receive the software. Large packages, like SAS and SPSS, require that you borrow the diskettes, install the software, and return the diskettes. Smaller packages, consisting of up to five diskettes, require you to bring your own diskettes.

For more detailed information about these site licences, telephone the UTCS Information Office at 978-4990.

These prices in effect until June 30, 1992 (Oct. 31, 1992 for SPSS/PC).

NOTE:

Site Licences at UTCS

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
Chaos in the Classroom I: Maps and Bifurcations					
PC	$12.00	Faculty, Staff, Graduate Students	One-time fee	One 5.25" or one 3.5"; bring own	Yes
CSLG					
There are over 250 individual software products included in this package.	$250.00	Departments with Digital hardware	One-time fee	Call 978-4595.	No
C++					
UNIX V, Release 2.1 Language System	$42.00	Faculty, Staff, Research	One-time fee	To purchase: call Evelyn Ward at 978-4990. Technical questions: Paul Kern at 978-4696.	No

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
IMSL					
UNIX Class IVA machines; FORTRAN Subroutines		U of T-owned machines	One-time fee	Tape cartridge or network download	Yes
IMSL (MATH, STAT, SFUN):	$935.00				
Exponent Graphics:	$475.00				
C BASE Library:	$445.00				
Interactive Document Facility:	$140.00				
Environmental Install. & Assurance Tests:	$140.00				
Registration Fee:	$588.00				
IMSL					
UNIX Class IVB machines; FORTRAN Subroutines		U of T-owned machines	One-time fee	Tape cartridge or network download	Yes
IMSL (MATH, STAT, SFUN):	$565.00				
Exponent Graphics:	$285.00				
C BASE Library:	$265.00				
Interactive Document Facility:	$87.00				
Environmental Install. & Assurance Tests:	$87.00				
Registration Fee:	$588.00				
IMSL					
PC; FORTRAN Subroutines		U of T-owned machines	One-time fee	Deposit $100; borrow and return diskettes	Yes
IMSL (MATH, STAT, SFUN):	$195.00				
Maple (single machine or network server)					
DecStation 2100, 3100 (Ultrix)	$300.00	Staff	One-time fee	Borrow and return diskettes, tape cartridge; network download	Yes
DecStation 5000, 5100 (Ultrix)	$500.00				
DecStation 5400, 5800 (Ultrix)	$760.00				
HP 9000/300, HP 9000, 400 (HP-UX 7.0)	$300.00				
HP 9000/700, HP 9000, 800 (HP-UX 7.0)	$430.00				
SUN 3 (SUN OS 4.0)	$240.00				
SUN 4, SPARCstation (SUN OS 4.0)	$300.00				
SGI Personal IRIS (Irix)	$300.00				
SGI Professional IRIS 50-80GT (Irix)	$500.00				
SGI Professional IRIS 120-240GT (Irix)	$760.00				
PC-386 (DOS; UNIX)	$200.00				
MIPS, RC3230 (UNIX)	$300.00				
IBM RS6000 model 320 (AIX)	$300.00				
Macintosh (Finder)	$130.00				
Note: station cost is half the single machine price.					

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
Novell Netware 3.11 — 20-user Licence					
PC; LAN		University Depart-ments	One-time fee	Deposit $50; borrow and return diskettes	Yes
Server Licence:	$2400.00				
Upgrade Licence:	$1335.00				
Upgrade from Other Vendor's Software:	$2000.00				
Novell Netware 3.11 — 100-user Licence					
PC; LAN		University Depart-ments	One-time fee	Deposit $50; borrow and return diskettes	Yes
Server Licence:	$4670.00				
Upgrade Licence:	$2000.00				
Upgrade from Other Vendor's Software:	$3336.00				
Other Novell Products					
Mac Netware 3.0:	$400.00	University Depart-ments	One-time fee	Deposit $50; borrow and return diskettes	Yes
Novell Netware NFS	$1335.00				
ProComm					
PC; Communications Note: Documentation on disk; part of package	Free	Faculty, Staff, Graduate Students, Under-graduate	N/A	Two 5.25"; bring own	Yes
QuickMail					
Mac; Electronic mail		Faculty, Staff	One-time fee	One 3.5"; bring own	No
Per user:	$35.00				
Upgrades:	$17.00				

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
SAS/PC					
PC; Statistical analysis BASE/STAT/GRAPH/FSP: IML module: ETS module:	 $35.00 $22.00 $35.00	Faculty, Staff, Graduate Students, Undergraduate	July 1- June 30	Deposit per binder (Maximum $100); borrow and return diskettes	Yes
SAS/PC network					
PC; Statistical analysis Per station:	 $17.00	Faculty, Staff, Graduate Students	July 1- June 30	Deposit per binder (Maximum $100); borrow and return diskettes	Yes
SAS/UNIX (Sun 3)					
UNIX; Statistical analysis BASE/STAT/GRAPH: FSP, IML modules:	 $198.00 ea. $70.00	Faculty, Staff, Graduate Students	July 1- June 30	Tape cartridge	Yes
SAS/UNIX (Sun 4)					
UNIX; Statistical analysis BASE/STAT/GRAPH: FSP module:	 $264.00 ea. $92.00	Faculty, Staff, Graduate Students	July 1- June 30	Tape cartridge	Yes
SPSS/PC					
PC; Statistical analysis FullPackage: Data Entry Module Only:	 $40.00 $20.00	Research	Nov 1- Oct 31	Deposit max. $50; borrow and return diskettes	No
SPSS/PC network					
PC; Statistical analysis FullPackage: Data Entry Module Only:	 $20.00 per station, plus server $10.00 per station, plus server	Research	Nov 1- Oct 31	Deposit max. $50; borrow and return diskettes	No

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
SYSTAT					
Mac; Statistical analysis	$58.00	Faculty, Staff, Graduate Students	July 1- June 30	Six 800KB 3.5" diskettes; bring own	Yes
SYSTAT network					
Mac; Statistical analysis Price per station, plus server:	$29.00	Faculty, Staff, Graduate Students	July 1- June 30	Six 800KB 3.5" diskettes; bring own	Yes
UNIX V, Release 4					
Operating System	$18.00	Faculty, Staff, Research	One-time fee	*Send electronic mail to molnar@gpu.utcs.utoronto.ca*	No
WATFOR-77					
PC; FORTRAN compiler [$35 WATFOR-87 (math co-processor)] GKS (Graphics Kernal System)	$35.00 Add $5.00	Research	July 1- June 30	Two-three 5.25" diskettes; bring own	Yes
WordPerfect (individual & networked machines)					
PC; WordProcessing New, per machine: Upgrade, per machine:	$42.00 $15.00	Faculty, Staff	One-time fee	Deposit $25; borrow and return diskettes	Yes

***Documentation available at UTCS**

PC Maintenance

Below is a listing of some microcomputer equipment which UTCS Micro Sales & Maintenance covers under yearly maintenance contracts. All contracts are based on a minimum 12 month period. Service calls are handled on a first-priority basis. Average response time is four hours. Equipment must be certified as operational prior to commencement of a maintenance contract. (There is no extra charge for this service.) Please contact UTCS Micro Sales & Maintenance at 978-5050 or 978-1299 to obtain service and pricing information.

IBM PC or Compatible Equipment

Systems
IBM PC PS/2 systems or compatibles
386, 486 systems
Notebooks
Laptops

Disk Drives
360KB & 1.2MB 5.25-inch Floppy
720KB & 1.4MB 3.5-inch Floppy

Hard Disk Drives
20 to 320 Megabyte

Displays
Monochrome
CGA / EGA / VGA Colour
PS/2 Monochrome/Colour
Most monitors

Modems
1200 & 2400 baud

Laser Printers
HP LaserJet
HP LaserJet II
PS Jet +
QMS PS 800
QMS PS 800+
QMS 810

Dot Matrix Printers
C-ITOH
Epson
IBM
NEC
Panasonic
Roland
Toshiba
Most makes

Apple Macintosh Equipment

Systems
Mac 128, 512, Plus
Mac Classic - All Models
Mac LC - All Models
Mac SE - All Models
Mac SE/30 - All Models
Mac II, IIx, IIcx, IIci, IIsi, IIfx
PowerBooks
Quadras

Disk Drives
400KB, 800KB 3.5-inch Floppy
1.4MB 3.5-inch Floppy

Hard Disk Drives
20 to 320 Megabyte

Displays
Apple Mac 12-inch Monochrome
Apple Mac 12-inch RGB
Apple High-Res 12-inch Monochrome
Apple High-Res 13-inch Colour

Modems
1200 & 2400 baud

Laser Printers
Personal LaserWriter LS
Personal LaserWriter NT
LaserWriter
LaserWriter Plus
LaserWriter IINT
LaserWriter IINTX

Dot Matrix Printers
ImageWriter I
ImageWriter II
ImageWriter II/L
Apple StyleWriter

UTCS also supplies and installs floppy disk drives, hard disk drives, video and other boards, math coprocessors, and memory upgrades.

Support for UNIX

We support timesharing on GP UNIX under Sun OS 4.1.1.

Support for VM/CMS

We support CMS release 6.0 under CP/HPO releave 6.0 For CMS support, call Supervisor Ted Sikorski at 978-6602.

Support by UTCS Advising

The following are microcomputer software packages supported by the UTCS Advising and Consulting Group. This service is available to University of Toronto faculty, staff, and graduate students. For assistance with the products listed below, call 978-HELP, Monday through Friday, between 12:00 noon and 6:00 p.m.

Package/Compiler	Version	Environment
Communications		
File Transfer & Terminal Emulators		
MacKermit	0.9(64)	Macintosh
ProComm	TU 2.4.2	MS-DOS
Database Managers		
dBASE IV	1.1	MS-DOS
FoxBASE Mac	2.01	Macintosh
Electronic Mail		
QuickMail	2.2.3	Macintosh
Operating Systems		
IBM PC & Compatibles		
Microsoft MS-DOS (incl. IBM PC-DOS)	5.0	n/a
Macintosh		
Finder	6.0.X	n/a
MultiFinder	6.0.X	n/a
System	6.0.X	n/a
Spreadsheet & Charting		
Lotus 1-2-3	2.02	MS-DOS
Microsoft Excel	2.2a, 3.0	Macintosh
Statistical		
SAS/PC	6.04	MS-DOS
SPSS/PC+	4.0	MS-DOS
SYSTAT	5.1	Macintosh
SAS	5.18, 6.07*	VM/CMS
SPSS^x	3.1, 4.1	VM/CMS
SAS	6.03, 6.07	UNIX, Sun3, Sun4
Word Processing		
Microsoft Word	4.0	Macintosh
WordPerfect	5.1	MS-DOS

*Fall 1992

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